WHAT IS CLAIMED IS:

1. An acoustic telemetry apparatus for transmitting signals from a first location within a well borehole to a second location, comprising:

(a) an elongated member having a longitudinal bore;

(b) a reaction mass moveably disposed on the elongated member; and

(c) an actuator coupled to the elongated member and the reaction mass, the actuator capable of inducing an axial reciprocating movement of reaction mass relative to the elongated tube, whereby the reciprocating movement causes an acoustic wave to transmit into the elongated member, the acoustic wave being indicative of the signal.

2. An apparatus according to claim **1**, further comprising a controller for controlling the apparatus.

3. An apparatus according to claim **1**, further comprising a displacement sensor for sensing a position of the reaction mass relative to the elongated member.

4. An apparatus according to claim **1**, further comprising a controller, a displacement sensor and a feedback loop connected to the sensor and controller for conveying an output of the displacement sensor to the controller, the conveyed output at least partially determinative of controller actions in controlling the actuator.

5. The apparatus of claim **1**, wherein the elongated member is selected from a group consisting of (i) a jointed drill pipe, (ii) a coiled tube, and (iii) a production tube.

6. The apparatus of claim **1**, wherein the actuator is at least one electromagnetic device coupled to the reaction mass and to the elongated tube.

7. The apparatus of claim **6**, wherein the at least one electromagnetic device is a linear electromagnetic drive.

8. The apparatus of claim **6**, wherein the at least one electromagnetic device is at least two electromagnetic devices comprising a first electromagnetic device and a second electromagnetic device, the first electromagnetic device coupled being coupled to the reaction mass at a third location and the second electromagnetic device being coupled to the reaction mass at a fourth location spaced apart from the third location.

9. The apparatus of claim **1**, wherein the actuator is coupled to the reaction mass with a biasing element.

10. The apparatus of claim **9**, wherein the biasing element is at least one spring.

11. The apparatus of claim **1**, wherein the reciprocating movement is an oscillation at a predetermined frequency.

12. The apparatus of claim **11**, wherein the predetermined frequency is a resonant frequency.

13. The apparatus of claim **1**, wherein the actuator is a fluid control device.

14. An apparatus according to claim **1**, wherein the fluid control device is a fast operating valve.

15. An apparatus according to claim **13**, wherein the fluid control device is a rotating valve.

16. An apparatus according to claim **15**, further comprising a motor for operating the rotating valve.

17. The apparatus according to claim **16**, wherein the motor is selected form a group consisting of (i) a synchronous motor and (ii) a stepper motor.

18. The apparatus according to claim **13**, wherein the fluid control device is a variable flow restrictor.

19. The apparatus of claim **18**, wherein the variable flow restrictor is a poppet valve.

20. The apparatus of claim **19**, wherein the flow restrictor further comprises a pilot valve.

21. The apparatus of claim **13**, wherein the first passageway is a substantially annular space between the reaction mass and the elongated member and extending at least partially along the length of the reaction mass.

22. The apparatus of claim **13**, wherein the first passageway is a central bore extending through the reaction mass.

23. A method of transmitting a signal from a first location within a well borehole to a second location comprising:

(a) conveying into the borehole on an elongated member having a longitudinal bore, a reaction mass and an acoustic actuator, the reaction mass being movably disposed on the elongated member and operatively coupled to the acoustic actuator; and

(b) enhancing a reciprocating movement in the reaction mass using the acoustic actuator whereby the reciprocating movement causes an acoustic wave to transmit into the elongated member, the acoustic wave being indicative of the signal;

24. The method of claim **23**, further comprising controlling the acoustic actuator with a controller.

25. The method of claim **23,** further comprising measuring positions of the reaction mass relative to the elongated member with a displacement sensor.

26. The method of claim **23,** further comprising measuring position of the reaction mass with a displacement sensor transmitting a value indicative of its measured position to a controller using a feedback loop, and controlling the acoustic actuator with the controller.

27. The method of claim **23,** wherein inducing its reciprocating movement is accomplished using an acoustic actuator selected from a group consisting of (i) an electromagnetic drive, (ii) a linear electromagnetic drive, and (iii) a fluid control device.

28. The method of claim **23,** further comprising biasing the reaction mass position with the biasing element.

29. The method of claim **23,** wherein inducing reciprocating movement in the reaction mass is inducing a reciprocating movement at the predetermined frequency.

30. The method of claim **19,** wherein the predetermined frequency is a resonant frequency.

31. The method of claim **23** further comprising controlling fluid flow within the elongated member with the acoustic actuator, the control flow being used to cause the reciprocating movement.

32. The method of claim **31**, further comprising using an actuator selected from a group consisting of (i) a poppet valve and (ii) a rotary valve.

33. The method of claim **32**, wherein the rotary valve is selected, the method further comprising controlling its rotary valve with a motor selected from a group consisting of (i) a synchronous motor and (ii) a stepper motor.